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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,436	12/12/2003	Heinrich Sussner	SUSS-001	2310

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THOMAS R. BERTHOLD
18938 CONGRESS JUNCTION COURT
SARATOGA, CA 95070

EXAMINER

LE, THONG QUOC

ART UNIT PAPER NUMBER

2818

DATE MAILED: 01/05/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/735,436

Applicant(s)

SUSSNER, HEINRICH

Examiner

Thong Q. Le

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 33-39 is/are allowed.
- 6) ☒ Claim(s) 1-17, 20-32 and 40-47 is/are rejected.
- 7) ☒ Claim(s) 18 and 19 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

1. Pre-amendment filed on October 12, 2004 has been entered.
2. Claims 1-47 are presented for examination.

Information Disclosure Statement

3. This office acknowledges receipt of the following items from the Applicant:
Information Disclosure Statement (IDS) filed on 03/26/2004.
Information Disclosure Statement (IDS) filed on 04/19/2004.
4. Information disclosed and list on PTO 1449 was considered.

Specification

5. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

6. Regarding 8, 11, lines 2, should be changed "first word line" to –first conductive word line—as defined in claim 1.
7. Regarding 11, lines 2, should be changed "second word line" to –second conductive word line—as defined in line 2.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-17,20-32,40-47 are rejected under 35 U.S.C. 102(b) as being anticipated by Saito et al. (U.S. Patent No. 6,522,573).

Regarding claims 1, 20, 40, Saito et al. disclose a magnetic random access memory (MRAM) with stackable architecture comprising:

a first memory column (Figure 2) comprising a plurality of magnetic memory cells (20,30) electrically coupled and stacked on top of each other, each magnetic memory cell configured to store data;

a first conductive word line (18) electrically coupled to the first memory column;
and

a first bit line column (Figure 1, 22) horizontally disposed from and parallel to the first memory column, the first bit line column electrically isolated (21) from the first word line and comprising a plurality of conductive bit lines (Figures 3A-3D) electrically isolated from the first memory column and from each other, the first bit line column positioned close enough such that an electric current passing through one of the plurality of bit lines will produce a magnetic field affecting one of the plurality of magnetic memory cells (Column 8, lines 15-65).

Regarding claims 2-17, 21, 41-46, Saito et al. disclose wherein one of each the plurality of bit lines is vertically aligned with one of each of the plurality of magnetic memory cells (Figures 3A-3D), and wherein one of each of the plurality of bit lines is perpendicular to the first memory column (Figures 3, Column 7, lines 60-64), and an insulator positioned between the bit line column and the memory column (Figures 3), and a second bit line column electrically isolated from the first word line (Figure 2, Figures 3), the second bit line column comprising a plurality of conductive bit lines electrically isolated from each other and configured to carry electric current during a memory read and a memory write (Figure 2, Figures 4-5, Column 6, lines 55-61), and wherein the second bit line column is electrically isolated from the first memory column (Figures 3A-3D), and the second bit line column is parallel to the first bit line column (Figures 3A-3D), and the first and second bit line column are perpendicular to the first word line (Figures 3A-3D, first word line 18, first and second bit lines 22), and wherein the first and second bit line columns are opposite sides of the first memory column (Figure 2), and further comprising: a second memory column (Figure 2) electrically coupled to the first word line and comprising a plurality of magnetic memory cells electrically coupled and adjacent to each other, each memory cell configured to store data, the second memory column parallel to the first memory column and adjacent to the first bit line column (Figure 2), and a second conductive word line (Figure 2, 19) parallel to the first word line (Figure 18); and a third memory column (Figure 3, 10) electrically coupled to the second word line and comprising a plurality of magnetic memory cells electrically coupled and adjacent to each other, each memory cell

configured to store data wherein the third memory column is parallel to the first memory column (Figures 3, cell 20), and wherein the third memory column is positioned between the first and second bit line columns (Figures 3), and wherein one of the plurality of memory cells in the first memory column is configured to store data when electric current flows through the first word line into the first memory column and electric current flows through one of the plurality of bit lines in the second bit line column (Figure 2), and wherein one of the plurality of memory cells in the first memory column is further configured to store data when electric current flows through one of the plurality of bit lines in the first bit line column, and the direction of current flowing through one of the plurality of bit lines in the first bit line column is opposite the direction of current flowing through one of the plurality of bit lines in the second bit line column (Figure 2), wherein the direction of current flowing through one of the plurality of bit lines in the first bit line column is the same as the direction of current flowing through one of the plurality of bit lines in the second bit line column (Figure 2), and each of the plurality of memory cells in the first memory column further comprising a readout layer configured to have a magnetic polarization (Figure 2, 20,30)

10. Regarding claims 22-31, Saito et al. disclose a method of writing to MRAM and a method of reading from MRAM (Figures 3A-3D, Figures 4-5, Column 6, lines 50-61, Column 8, lines 12-67, Column 9, lines 1-37).

11. Regarding claim 32, Saito et al. disclose a method of selecting a MRAM (Figure 2).

12. Regarding claim 47, Saito et al. disclose a method of manufacturing a co-planar MRAM (Figure 1).

Allowable Subject Matter

13. Claims 18-19 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 18-19 include allowable subject matter since the prior art made of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed limitations. Saito et al. (U.S. Patent No. 6,522,573), and others, does not teach the claimed invention having a storage layer coupled to the readout layer and configured to have a magnetic polarization, and the storage layer having a higher coercivity than the readout layer.

14. Claims 33-39 are allowed.

15. Claims 33-39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 33-39 include allowable subject matter since the prior art made of record and considered pertinent to the applicant's disclosure does not teach or suggest the claimed limitations. Saito et al. (U.S. Patent No. 6,522,573), and others, does not teach the claimed invention having a storage layer coupled to the readout layer and

Art Unit: 2818

configured to have a magnetic polarization, and the storage layer having a higher coercivity than the readout layer.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thong Q. Le whose telephone number is 571-272-1783. The examiner can normally be reached on 8:00am-5:00pm M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on 571-272-1787. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Thong Q. Le
Primary Examiner
Art Unit 2818

THONG LE
PRIMARY EXAMINER